

CLAIMS

What is claimed is:

1. An insert for use in a gripping apparatus, the insert comprising:
 - a base member having a longitudinal axis and a perpendicular axis;
 - a plurality of teeth extending from said base member, each of said teeth having a width, and wherein said teeth are formed in a first and second row, said first and second rows being substantially adjacent and parallel to said longitudinal axis; and
 - wherein said teeth in said first row are offset longitudinally from said teeth in said second row.
2. The insert of claim 1 wherein said teeth further include a crest having a crest length, said crest length being less than said width.
3. The insert of claim 2 wherein said crest length is approximately one-half of said width.
4. The insert of claim 2 wherein said crest length is approximately within the range of 0.050 inches to 0.500 inches.
5. The insert of claim 4 wherein said crest length is approximately 0.150 inches.
6. The insert of claim 1 wherein the insert is formed of steel.
7. The insert of claim 1 wherein the insert is formed using a die.

8. The insert of claim 7 wherein the insert is formed using investment casting technology.
9. The insert of claim 1 wherein said teeth have a resistance profile, wherein said resistance profile is a substantially straight line.
10. The insert of claim 1 wherein the insert has a length and said teeth have an effective resistance length, said resistance length being at least 75% of said insert length.
11. The insert of claim 10 wherein said resistance length is approximately 100% of said insert length.
12. The insert of claim 1 wherein said teeth lie in more than two substantially adjacent rows.
13. The insert of claim 1 wherein said teeth are chisel-shaped.
14. The insert of claim 1 wherein said teeth are separably attached to said base member.
15. An insert for use in a gripping apparatus, the insert comprising:
 - a base member having a longitudinal axis and a perpendicular axis;
 - a plurality of teeth extending from said base member, each of said teeth having a first and second gripping face and a first and second side face, and wherein said teeth are formed in at least two substantially adjacent rows;

wherein each of said rows has gaps between said side faces of adjacent of said teeth; and

wherein said gaps within one of said rows are substantially aligned parallel to said perpendicular axis with said gripping faces of said teeth in another of said rows.

16. The insert of claim 15 wherein said teeth further include a crest having a crest length, said crest length being approximately equal to the length of said gaps.

17. The insert of claim 15 wherein the insert has a length and said teeth have an effective resistance length, said resistance length being at least 75% of said insert length.

18. The insert of claim 17 wherein said resistance length is approximately 100% of said insert length.

19. An insert for use in a gripping apparatus, the insert comprising:

a base member having a longitudinal axis and a perpendicular axis;

a plurality of teeth extending from said base member, each of said teeth having a width, a first and second gripping face, and a first and second side face, wherein said teeth are formed in a first and second row, said first and second rows being substantially adjacent and parallel to said longitudinal axis;

wherein said first row is offset longitudinally from said second row; and

wherein said teeth are canted.

20. An insert for use in a gripping apparatus, the insert comprising:
- a base member having a longitudinal axis and a perpendicular axis;
 - a plurality of teeth extending from said base member, each of said teeth having a first and second gripping face and a first and second sloping side face, and wherein said teeth are formed in at least two substantially adjacent rows;
 - wherein each of said rows has gaps between said side faces of adjacent said teeth;
 - and
 - wherein said gaps are set at an angle relative to said perpendicular axis, said gaps in one of said rows being aligned with said gaps in each substantially adjacent row.
21. The insert of claim 20 wherein said gaps are formed by machining said gaps into columns at said angle from said perpendicular axis.
22. The insert of claim 20 wherein said teeth are canted.
23. A method of manufacturing an insert for use in a gripping apparatus, the method comprising:
- creating a model of the insert, said model comprising:
 - a base member having a longitudinal axis and a perpendicular axis;
 - a plurality of teeth extending from said base member, each of said teeth having a width, and wherein said teeth are formed in a first and second row, said first and second rows being substantially adjacent and parallel to said longitudinal axis;

wherein said teeth in said first row are offset longitudinally from said teeth in said second row;
forming a crust around said model;
pouring molten metal into said crust;
allowing said molten metal to cool; and
separating said crust from said metal.

24. The method of claim 23 wherein said metal is steel.
25. The method of claim 23 wherein said teeth of said model lie in more than two substantially adjacent rows.
26. The insert of claim 23 wherein said teeth of said model have a resistance profile, said resistance profile being a substantially straight line.
27. The insert of claim 23 wherein the model has a length and said teeth have an effective resistance length, said resistance length being at least 75% of said length.
28. The insert of claim 27 wherein said resistance length is approximately 100% of said length.